

REMARKS/ARGUMENTS

Applicants' invention relates to an illumination system which combines the outputs of two or more light sources. In accordance with claim 1, a first optical system directs the light from the first source into the second source, and in addition, creates an image of the first source substantially coincident with the second source. A second optical system relays the images of the first and second light sources to an aperture which acts as a virtual source. A third optical system then relays an image of the virtual source at the aperture to the sample. (See specification, page 4, line 28 to page 11).

The concept of projecting an image of the source onto the sample is often referred to by those skilled in the art as "critical illumination." Critical illumination tends to maximize light intensity at the sample. Critical illumination is significantly different from Koehler illumination which is utilized in the primary reference relied up by the Examiner in the rejection of the claims (Kokubo, 5,686,993). Koehler illumination tends to improve light uniformity across the field.

Turning to Kokubo, light from the two lamps is delivered to a glass rod (GL). The purpose of glass rod is to mix the light to reduce wavelength variations. After exiting the glass rod, light is directed through a field stop (FS) and focused by the reflection objective lens (RO) onto the sample. The pupil of reflection objective is conjugate with the deuterium lamp to create Koehler illumination. Thus, in Kokubo, an efforts is made to image the lamps onto the pupil of the objective, rather than image the light sources onto the sample. Applicants have amended the independent claims to make this difference more apparent.

Applicants have also amended the claims to delete the reference to the word "stop" in the instances when the word appears as a modifier for "aperture." More specifically, in most instances of the specification, the term "aperture" is used alone. The term "stop" was used in a few instances in the specification and was used in most of the claims. Upon review, it is believed the term aperture is more appropriate than "aperture stop" since an "aperture stop" is often used by those skilled in the art to refer to the smallest or limiting aperture in the system and that meaning was not intended.

Turning to the specifics of the Office Action, the Examiner rejected most of the claims based either on Kokubo patent (5,686,993) alone, or in combination with Carlson (4,771,629), Sei (WO 01/06173) and Hallmeyer (6,504,608). As noted above, the Kokubo reference is distinguishable over the amended claims since it is designed to produce Koehler illumination. In


contrast, the subject invention, as defined by the amended claims, creates critical illumination, wherein the optical system is used to create an image of the aperture (and hence a virtual image of the source) at the sample. This approach maximizes the light level in order to improve measurement.

The secondary references were cited with respect to features set forth in various dependent claims. It is respectfully submitted that none of these references overcome the deficiencies of the Kokubo reference in anticipating or rendering obvious the amended independent claims. In view of the above, it is respectfully submitted that the amended independent claims define patentable subject matter and allowance thereof, along with the claim depending therefrom is respectfully solicited.

Respectfully submitted,

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Dated: 9/1/01

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